

PATENT SPECIFICATION



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160,007

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PROVISIONAL SPECIFICATION.

Improvements in Cloth Cutting Machines.

I, WILLIAM HAMILTON, of Lindum Street, Rusholme, City of Manchester, Mechanical Engineer, do hereby declare the nature of this invention to be as follows:—

This invention relates to hand or portable machines for cutting cloth, textiles, and other articles or materials, and is designed to provide a light, handy, flexible and economical machine, capable of being handled and moved in any desired direction, while the work remains stationary.

In mechanical cutters or saws as at present constructed the machine is stationary, and the moving saw band or knife remains in the same position, the article to be cut, sawn or severed being moved so that the cutting may proceed along a line or pattern that has to be followed.

The invention consists in the particular construction and disposition of the parts of the machine, comprising a continuous, rotating band knife or saw or series of knives revolving round pulleys or sprockets, a driving shaft, flexible or otherwise, an electric motor connected to the driving shaft by friction clutch and gears, an operating handle with switch levers and clutch levers adjacent thereto, a pressing device to rest upon the material and preferably placed in front of the machine.

The band knife or saw or series of knives carried by links are mounted upon pulleys or sprockets of suitable size carried in a frame which may be made with a telescopic support or foot arrangement to slide up or down, so that the length or number of knives or saws may be linked together or adjusted to the cutting depth or the bulk of cloth to be cut or severed.

[Price 1/-]

A suitable connecting rod and crank adjustment may be employed as a simple means of engaging the cog-wheels which drive the sprockets with a continuous series of knives or saws and connecting links.

The cog-wheels or smooth wheels will be made of suitable dimensions so as to give the desired speed or speeds of the knife, knives or saws when cutting, as well as being adaptable to the speed of the motor, or any other driving power.

The frame is made as small and compact as possible, and provided with a chamber to contain a small motor with an automatic cut-out and clutch which is controlled by a lever with a key way and feather. This lever is operated by an adjustable rod connected by a V shaped or bell crank lever placed adjacent to the handle, which moves the clutch out from the motor and applies a brake which stops the machine at once by thumb pressure being applied to the V shaped lever which has a spring suitable to resist the thumb pressure. In another form of the invention suitable wheels of certain dimensions are made adjusted to the driving wheels or clutch, so as to give a variable speed or speeds to the motor or to the rotation of the knife, knives or saws, or as an alternative a transformer may be used with the motor and connected to a lever on the handle of the machine, and so arranged that the desired speed is obtained corresponding to the pressure on the lever.

A sliding support may be given to the support for the knife sprocket, to permit of it being moved up and down to tighten the knife band or chain carrying the knives. This support may be adjusted and secured by set screws to just allow the free rotation of the knives or saws

round the sprockets, without any loosening of the connecting links or rivets. In cases where the chain knives are in use, either a semi-circular or a straight knife can be used to suit the style of cutting required.

An adjustable pressure or tension lever or presser is provided to rest against the surface of the material to press down upon the bulk of cloth to be cut, to prevent any undue shaking or movement of the cloth while the knives are cutting. This provides a means of steadying the cloth, thereby ensuring accurate cutting along the line or pattern to be cut or severed. This sliding lever or presser is provided with a set screw that holds it in the desired position, corresponding to the size or bulk of cloth required to be cut.

In cases where the machine is used for cutting wood or metal substances, a suitable saw is devised, with sufficient feather on the cutting edge wide enough to allow the foot support to pass through the lines cut. It may also be advisable in some cases to make the back of the knives or saws milled to correspond with the milled edges of the sprockets, which may be flanged if necessary.

The apparatus is provided with a foot which passes under the cloth or the material to be cut, sawn or severed. When cutting cloth the foot lifts it up slightly from the table to facilitate cutting.

The foot arrangement may be made with suitable rollers or table races, which is most adaptable to the table used for cutting, as well as the movement of the machine.

The foot may be made in one, two, or three parts hinged or connected together so that, in the case of cloth cutting and where the table is uneven, much more flexibility is given to the movement of the machine, and better cutting is obtained.

An electric lamp is hung in front of the cloth cutting machine to show up the lines or patterns to be cut when the machine is in operation, and may be illuminated by the energy or electric current working in conjunction with the motor.

A reflector is also arranged in front of the lamp or light to throw the rays of light on the work to be cut.

In the case of the chain knives or saws being used for cutting, the top half portion of the knives or saws may be used for cutting either by reversing the knives or saws or reversing the motor.

This will prove very advantageous, as by so doing both sides of the knives or saws are then being used, and a much keener edge is kept on the knives or saws used for cutting purposes. These small knives or saws may be made in quantities, together with the links suitably made to fasten together, so that the desired length of knives or saws can be linked together for cutting purposes.

A small grindstone to keep a keen edge on the knife or knives may be arranged to hang in front of the knives either when in use, and swing back after using. The emery wheel or wheels are arranged to rotate at a certain angle, to correspond with the cutting edge, and the shape of the knife to be sharpened.

The pressure of the grinder can be regulated by a small handle and suitable springs.

In many cases it will be of special advantage to adopt a flexible or elastic centre shaft instead of solid, as for example in cutting wood and other solid substances. The flexibility or elasticity of drive tends to cut wood better and easier without the liability of the wood seizing the saws as is often the case when a direct solid stroke is made when sawing.

A great disadvantage is experienced in the use of reciprocating knives, and much inconvenience is complained of when cutters have to use them, as the shock of constant vibration not only causes strain to the wrist and nerves, but it is found most difficult to move the machine along the line or pattern to be followed with the accuracy requisite for neat cutting.

The present invention has a great advantage as an anti-vibrator as well as ensuring accuracy in cutting with a minimum noise and a continuous steady run in working transit.

Dated this 18th day of December, 1919.

J. OWDEN O'BRIEN,
Successor to and late of W. P. Thompson
& Co., of Manchester,
Patent Agent.

COMPLETE SPECIFICATION.

Improvements in Cloth Cutting Machines.

I, WILLIAM HAMILTON, of Lindum Street, Rusholme, City of Manchester,

Mechanical Engineer, a British subject, do hereby declare the nature of this inven-

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tion and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to hand or portable electrically driven machines for cutting cloth, textiles and other articles or materials of the type provided with an endless cutting member revolving round
10 pulleys or sprockets and a presser foot to rest on the material, and is designed to provide a light, handy, flexible and economical machine, capable of being handled and moved in any desired direction, while the work remains stationary.

15 The invention consists in the particular construction and disposition of the parts of the machine, comprising an endless rotating band knife or saw or series of
20 knives revolving round pulleys or sprockets, capable of cutting when rotated in either direction, a vertical driving shaft, an electric motor mounted above the pulleys or sprockets of the endless cutters, a friction clutch by which
25 the pulleys or sprockets are driven, an adjustable rack to keep the endless cutters taut, an operating handle with switch levers and clutch levers adjacent thereto,
30 and a pressing device to rest upon the material placed in front of the machine.

The invention will be fully described with reference to the accompanying drawings.

35 Fig. 1. Side elevation partly in section.

Fig. 2. Transverse section.

Fig. 3. Plan partly in section.

40 Figs. 4 and 5. Side and front elevations of a modified form of cutters.

The apparatus is constructed with a frame or housing A supported by a standard B on a foot or base plate C and a band knife or saw or series of knives D
45 formed of or carried by links d^1 .

The band knife D is mounted on pulleys or sprockets E of suitable size by which it is actuated carried in the frame A and passes over corresponding pulleys or
50 sprockets E^1 carried in the foot or base plate C.

The pulleys or sprockets E are mounted in an adjustable frame F which can be adjusted by a rack and wheels f to keep
55 the band knife D taut or to adjust the number of link blades d^1 .

The rack wheels f are carried on a spindle f^1 , taper at one end, and are locked by the screwed sleeve f^2 .

60 The sprocket wheels E which operate or traverse the band knife D are driven by friction bevels G G^1 from an electric motor H placed above the pulley or sprocket E. The bevels G, G^1 are in

frictional contact and covered with a suitable friction covering. The bevel G slides over a key or feather on the vertical driving shaft h of the motor H and is held in frictional contact with the bevel G^1 by a spring h^1 and is lifted out of contact with it by a lever g which may be pressed by the finger or thumb of the operator. The lever g also carries a brake pulley g^1 which is pressed against a corresponding bevel pulley g^2 to quickly arrest the traverse of the band knife D when the driving bevels G G^1 are thrown out of gear or raised out of contact.

Instead of two friction bevels to be moved into and out of contact, bevel wheels may be employed constantly engaged, with a friction clutch to engage the driving bevel G. Wheels G^1 may be made in different sizes to alter the speed of cutting knives, or different resistances be thrown in to reduce or increase the speed of the motor.

The frame A is made as small, compact and light as possible preferably of aluminium to carry the motor H and gearing, and is fitted at one side with a handle a by which it is held by the operator. A switch or contact lever K of bell crank or other suitable shape is pivoted adjacent to the handle a so that it may at the same time be grasped by the hand to bring the contact points k together to start the motor A. A reversing switch K^1 may be fitted to control or alter the direction of rotation of the motor when
100 desired.

The motor H is connected to any suitable source of electric supply with the interposition of any suitable resistance coil.

The band knife D is built up of a number of links, each alternate link forming a cutting blade d^1 as shown in Figs. 1 and 2. Or the band knife D may be constructed with a flexible band d^2 of steel or other material with slots into which are secured the cutting blades d^1 as shown in Figs. 4 and 5. Or it may be built up of a number of plain or serrated links forming the cutting blades d^1 the blades being of such a shape as to cut when revolving in either direction.

An adjustable pressure or tension lever or presser M is provided to rest against the surface of the material to press down upon the bulk of cloth to be cut, to prevent any undue shaking or movement of the cloth while the knives are cutting. This provides a means of steadying the cloth, thereby ensuring accurate cutting along the line or pattern to be cut or severed. This sliding lever or presser is provided with a set screw that holds it in
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the desired position, corresponding to the side or bulk of cloth required to be cut, and it is marked in inches or other scale of measurement.

- 5 A small grindstone N to keep a keen edge on the knife or knives may be fitted in front of the knife or knives when in use, and swing back after using. The emery wheel or wheels are arranged to rotate at a certain angle, to correspond with the cutting edge, and the shape of the knife to be sharpened, and is carried on a lever *n* with a ball joint *n'* locked by a screw *n''* so that it may be set at any angle.

- 10 The foot or base plate C may be made with suitable rollers or table races *c* and may be made in one, two or three parts hinged or connected together so that, in the case of cloth cutting and where the table is uneven, much more flexibility is given to the movement of the machine, and better cutting is obtained, and the standard B may, if desired, be made telescopic to allow of the depth of cut being altered.

- 20 An electric lamp O is hung in front of the machine to show up the lines or patterns to be cut when the machine is in operation, and may be illuminated by the energy or electric current working in conjunction with the motor.

- 30 The top half portion of the knife blades *d'* may be used for cutting, either by reversing the knives or reversing the motor. This will prove very advantageous as by so doing both sides of the knives are then being used, and a much keener edge is kept on the knives used for cutting purposes. These small knives may be made in quantities, together with the links suitably made to fasten together, so that the desired length of knives can be linked together for cutting purposes.
- 40 They may also be made with lateral flanges to guide or maintain them in position in the standard B.

- 50 In cases where the machine is used for cutting wood or metal substances, a suitable saw is devised, which will allow the standard B to pass through the lines cut. It may also be advisable in some cases to make the back of the knives or saws milled to correspond with the milled edges of the sprockets, which may be flanged if necessary.

- 60 In many cases it will be of advantage to adopt a flexible or elastic centre shaft instead of solid, as for example in cutting wood and other solid substances. The flexibility or elasticity of drive tends to cut wood better and

easier without the liability of the wood seizing the saws as is often the case when a direct solid stroke is made when sawing. and this may be attached to a motor, distinct from and at a distance from the machine.

A great disadvantage has been experienced in the use of reciprocating knives, and much inconvenience is complained of when cutters have to use them, as the shock of constant vibration not only causes strain to the wrist and nerves, but it is found most difficult to move the machine along the line or pattern to be followed with the accuracy requisite for neat cutting.

The present invention has a great advantage as an anti-vibrator as well as ensuring accuracy in cutting with a minimum noise and a continuous steady run in working transit.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A portable apparatus for cutting cloth or other material of the type referred to constructed with an endless band of cutters locked together capable of cutting when traversed in either direction and revolving round sprockets or pulleys carried by a frame supported by a standard and foot plate, the electric motor on the frame, mounted above the cutters with a vertical driving shaft, friction gearing to connect the motor with the band pulleys, a clutch to throw the driving wheels out of gear, and a presser to retain the material in position substantially as described.

2. A machine for cutting cloth or other material as in Claim 1 constructed with the driving sprockets mounted on an adjustable frame operated by a rack and pinion substantially as described.

3. In a machine for cutting cloth or other material as in Claim 1 a band knife constructed with a flexible band with blades affixed thereto substantially as described.

4. A machine for cutting cloth or other material substantially as described and shown.

Dated this 19th day of August, 1920.

J. OWDEN O'BRIEN,

Late W. P. Thompson & Co., of
Manchester,
Patent Agent.

[This Drawing is a reproduction of the Original on a reduced scale.]

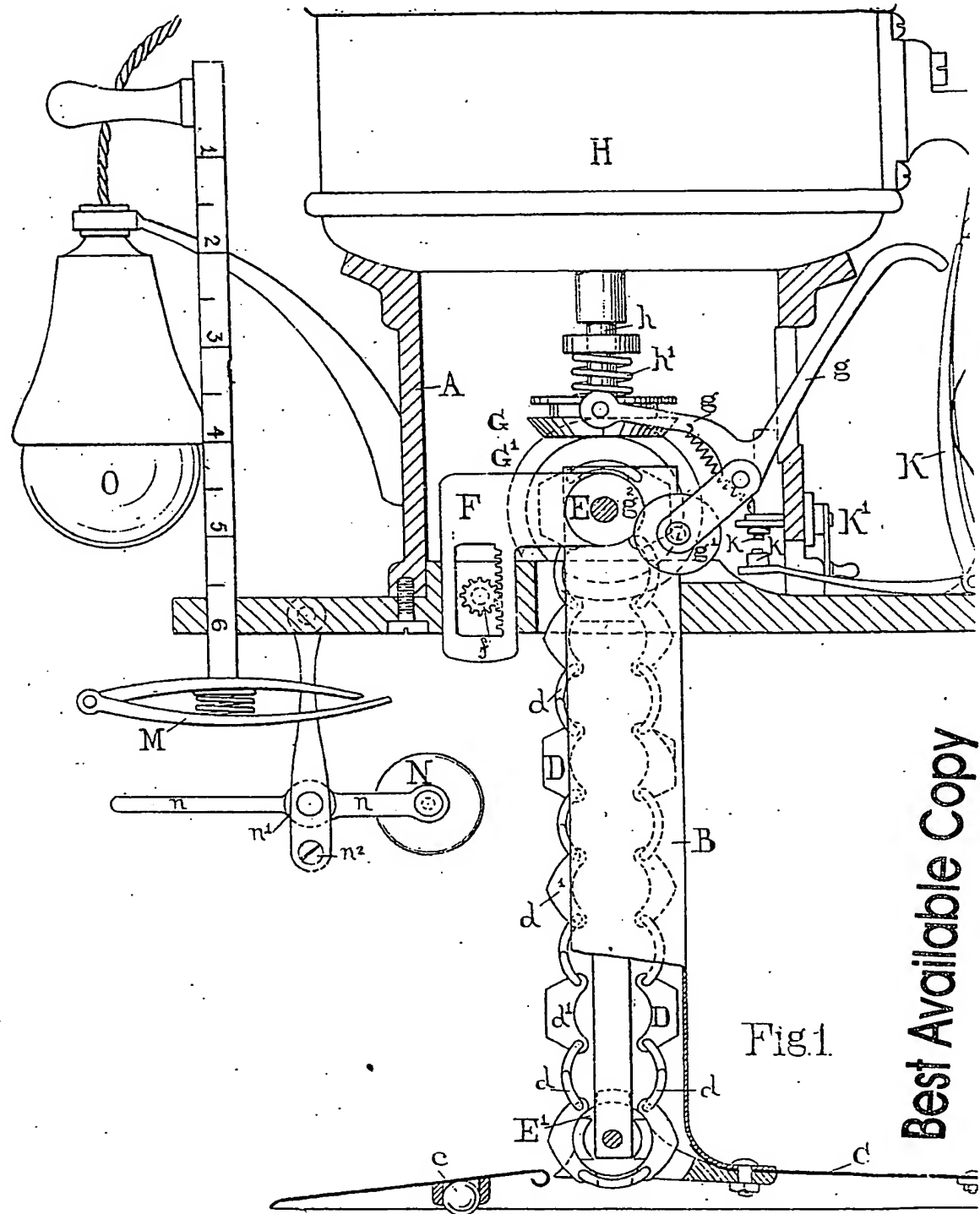


Fig. 1

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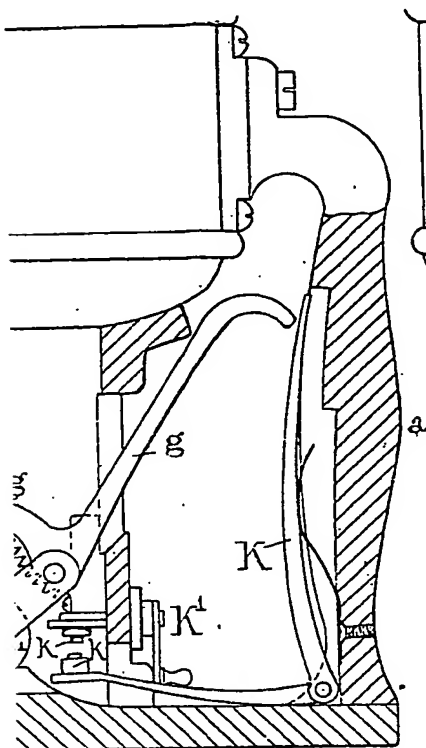


Fig. 1.

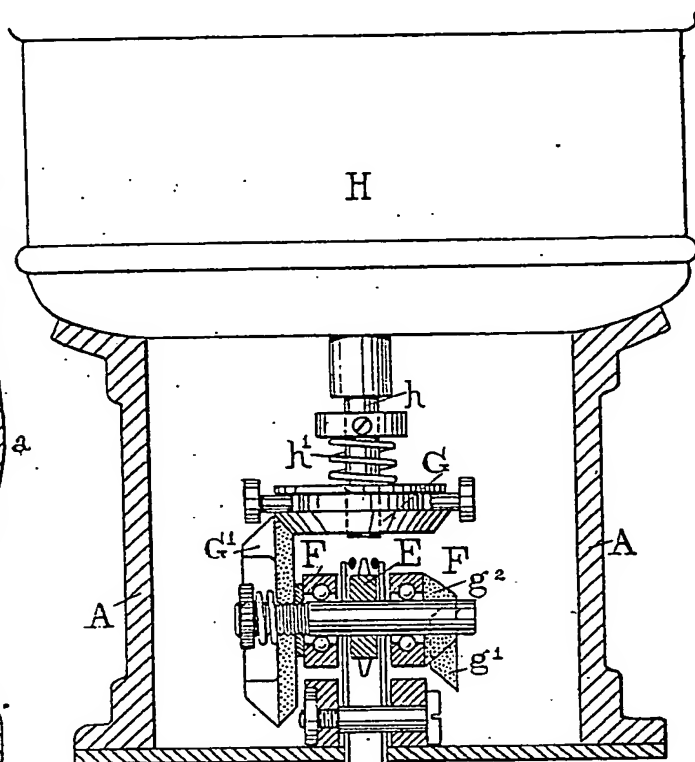
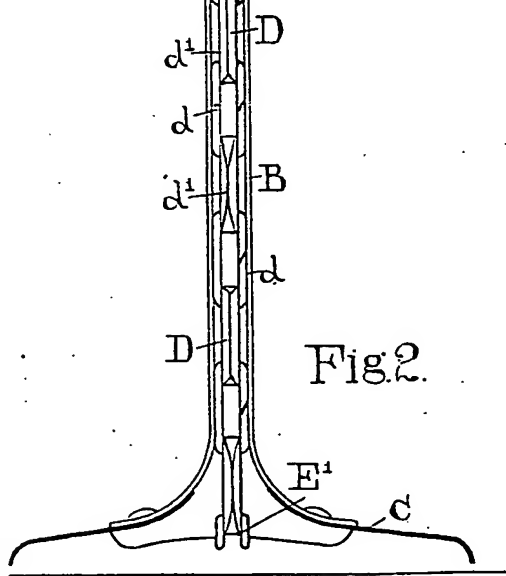
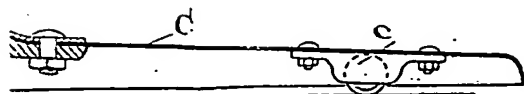
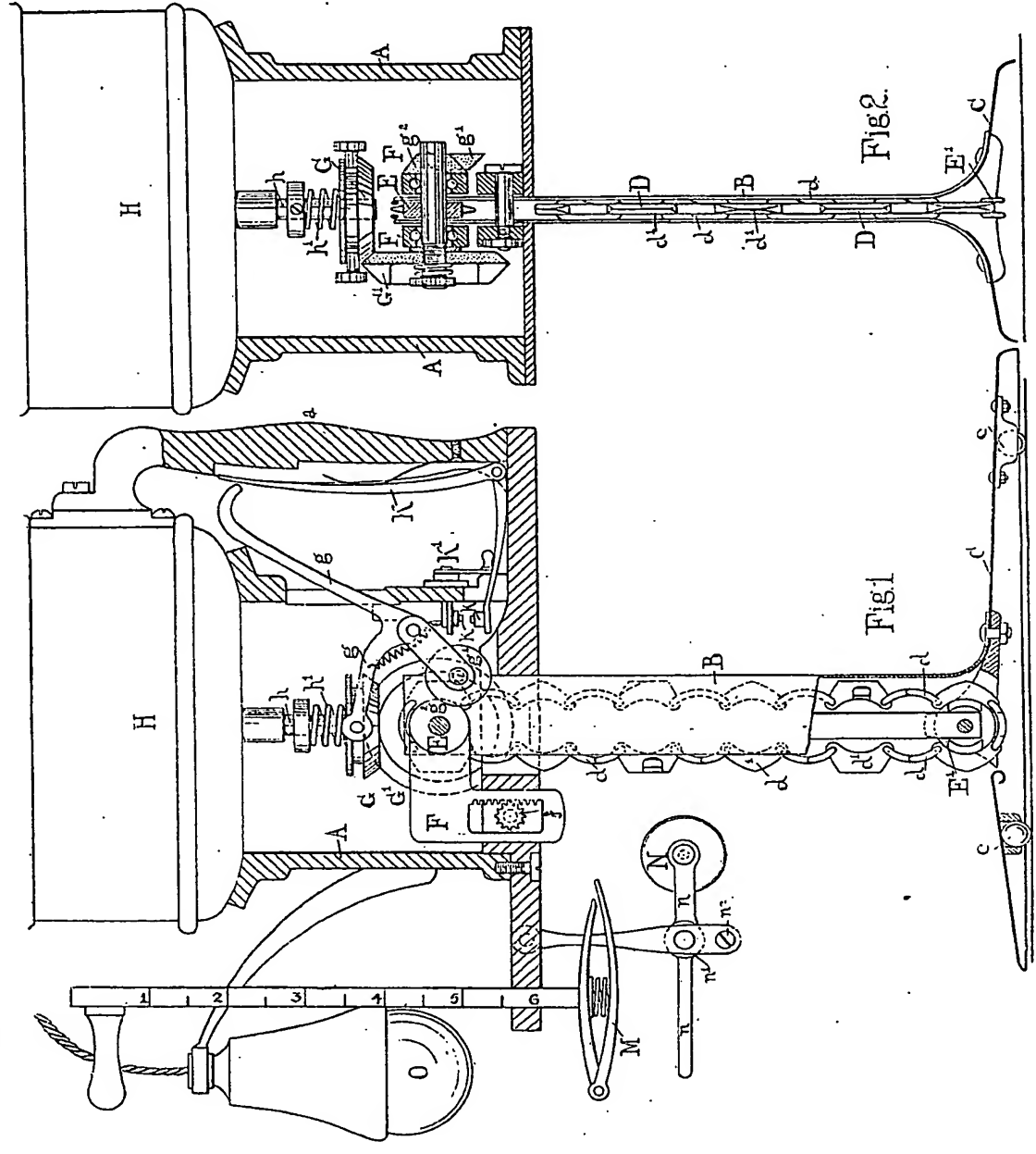


Fig. 2.

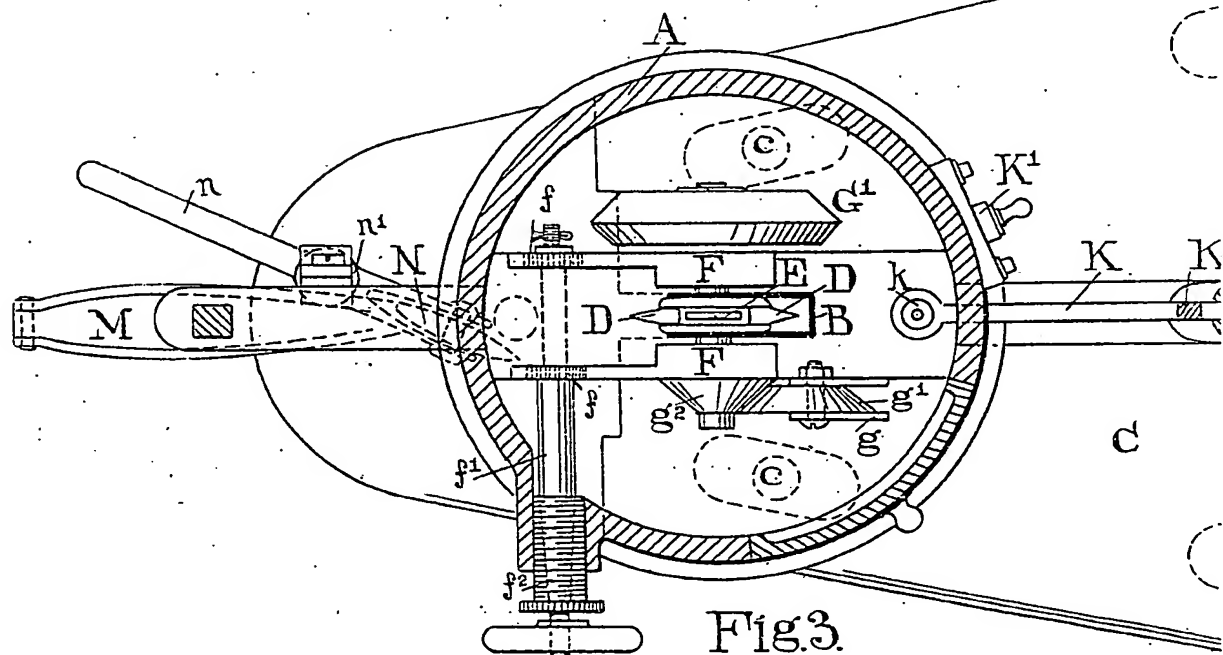


160,007 COMPLETE SPECIFICATION

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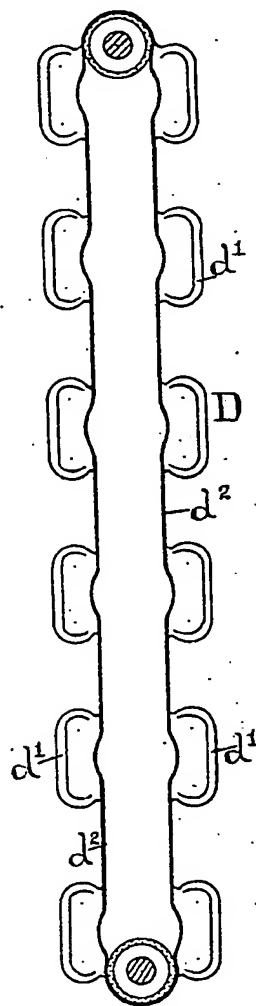
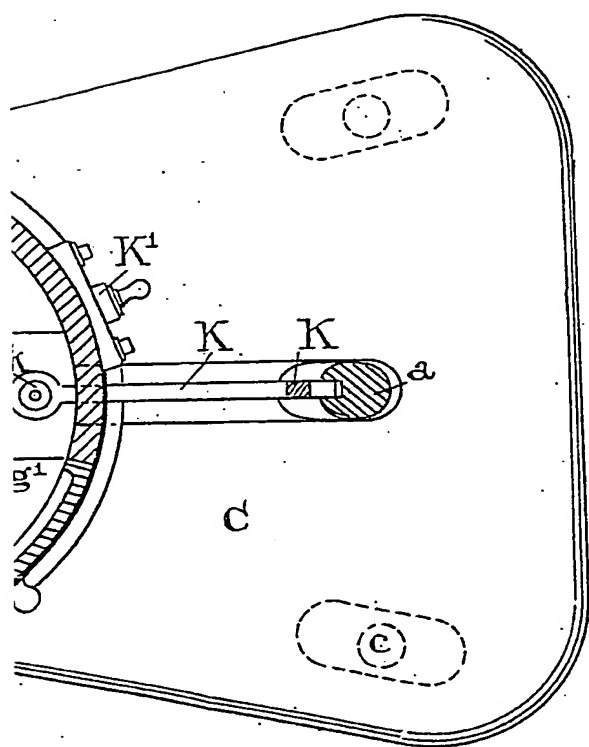


Fig. 4.

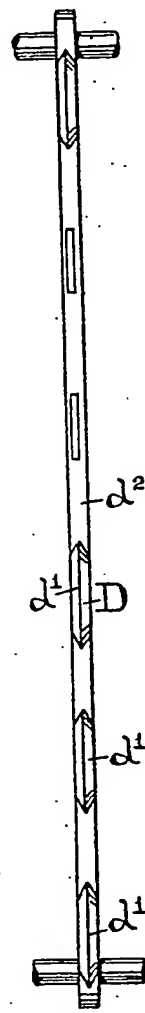


Fig. 5.

[This Drawing is a reproduction of the Original on a reduced scale]

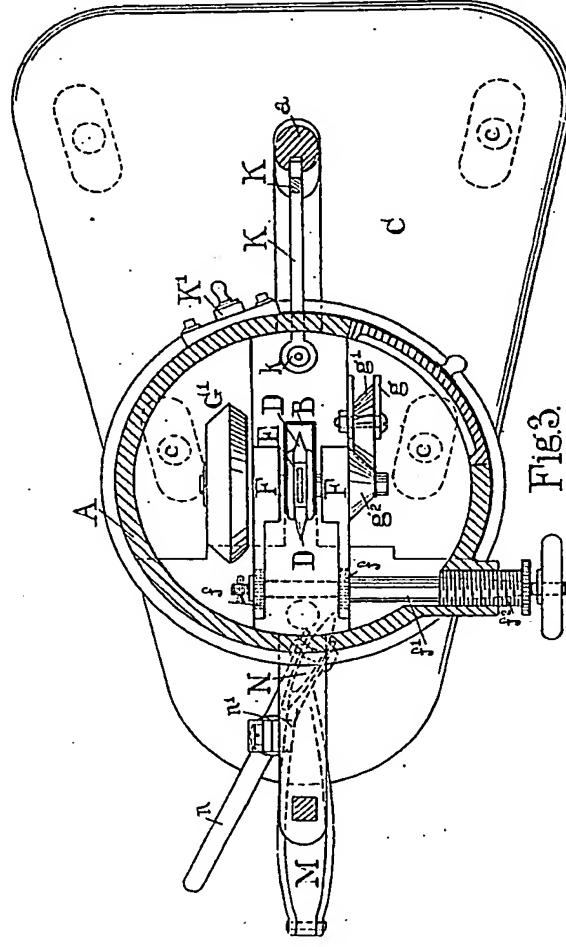


Fig. 3.

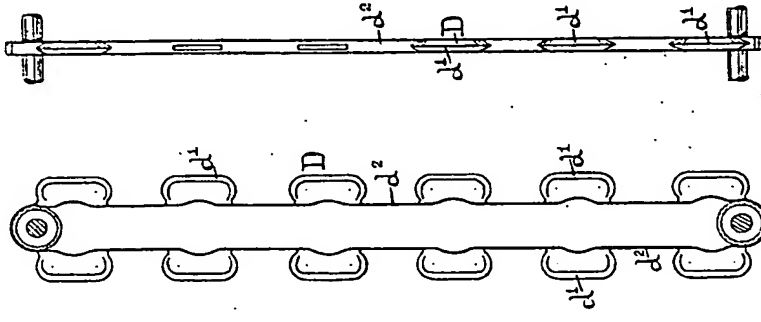


Fig. 4.

Fig. 5.